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Extended Abstract

[4+4] Anthracene Photodimerization for Controlled Folding of Single Chain Polymer Nanoparticles †

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Single-chain nanoparticles (SCNPs) have promising applications in a variety of fields, most notably catalysis. Current interest lies in achieving custom control over the resulting structure and size of the nanoparticles as well as ability of additional functionalization. The potential applications vary widely from catalysis applications to nanocarriers. Such intricate applications require a high level of control over the synthesized nanoparticles, which is one of the challenges in this field and is targeted by development of a range of experimental and modeling methods. Reversible photochemical reactions possess the much-looked-for benefit of allowing substantial control over the reaction in space and time [1], thus holding key potential for folding of polymer chains into single-chain nanoparticles. Therefore, herein, a kinetic model for a small-molecule photochemical reaction is developed for reversible anthracene dimerization in solution [2,3]. Determination of wavelength-dependent kinetic parameters for anthracene dimerization and its reverse reaction, together with calculation of competitive absorption from 260 to 330 nm, permits intricate control over the extent of the photochemical reaction through time, intensity and wavelength of irradiation [3]. Furthermore, the small-molecule model is currently being extended for application in single-chain polymer folding by using polymer chains synthesized with anthracene units incorporated.

Supplementary Materials: The following are available online at www.mdpi.com/2504-3900/69/1/7/s1, poster presentation.

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